Marburg Hemorrhagic Fever

Report Immediately

March 2003

1) THE DISEASE AND ITS EPIDEMIOLOGY

A. Etiologic Agent

Marburg hemorrhagic fever (MHF) belongs to group of viral hemorrhagic fevers (VHFs) which includes numerous zoonotic diseases, all of which cause a hemorrhagic syndrome in humans. Marburg fever is caused by a filovirus. VHFs have been recognized by the Centers for Disease Control and Prevention (CDC) as being among the top agents of concern for potential bioterrorist weapons.

B. Clinical Description and Laboratory Diagnosis

The onset of MHV is usually sudden. Patients may present with a brief prodrome characterized by nonspecific signs, including fever, headache, malaise, weakness, irritability, dizziness and muscle aches. Around the fifth day after the onset of symptoms, a maculopapular rash, most prominent on the trunk, may occur. Nausea, vomiting, chest pain, sore throat, abdominal pain, and diarrhea then may appear. As signs become more serious, jaundice, pancreatitis, delirium, shock and liver failure may occur. Bleeding occurs from mucous membranes manifested by nosebleeds and bleeding gums, and blood in vomit, urine, stools and sputum. Laboratory examination frequently shows reduced numbers of white blood cell and platelets levels, and renal failure may occur. About 25% of reported primary cases of MHV have been fatal.

Laboratory confirmation is based upon identifying the presence of specific antibodies in blood, serum or organ homogenates; or by detection of virus antigen in a clinical specimen by PCR; and by virus isolation in cell culture. **Laboratory studies represent an extreme biohazard and should be carried only where protection against infection of the staff and community is available.**

C. Reservoirs

Unknown despite extensive studies.

D. Modes of Transmission

Human infection of the index case in the two first outbreaks has occurred in laboratories after exposure to African green monkeys or their tissues. Once a human has acquired infection with Marburg virus, person-to-person transmission may occur. Persons become infected through contact with infectious blood, tissue or secretions from infected persons or animals. Bedding or other fomites may serve as a source of infection. Medical equipment that has not been properly cleaned or sterilized has been responsible for the spread of MHF.

E. Incubation Period

The incubation period for MHF ranges from three to nine days.

F. Period of Communicability or Infectious Period

Infected individuals are generally considered infectious for variable periods preceding the onset of symptoms and during the course of clinical symptoms. Virus may remain in the blood and secretions for months after an individual recovers. Contaminated bedding and medical equipment may remain infectious for several days.

G. Epidemiology

Marburg virus was first recognized in 1967 among African green monkeys brought from Uganda to Germany. Cases were also reported in Kenya and in Zimbabwe.

H. Bioterrorist Potential

The viruses that cause VHFs, including Marburg virus, are considered potential bioterrorist agents. If acquired and properly disseminated, these viruses could cause a serious public health challenge in terms of ability to limit the numbers of casualties and control other repercussions from such an attack.

2) REPORTING CRITERIA AND LABORATORY TESTING SERVICES

A. New Jersey Department of Health and Senior Services (NJDHSS) Case Definition:

There is no formal NJDHSS or CDC case definition for Marburg hemorrhagic fever (MHF).
Report any illness suspected by a healthcare provider of being MHF and any potential exposure to an agent that could cause MHF.

B. Laboratory Testing Services Available

The Public Health & Environmental Laboratories (PHEL) of NJDHSS do not provide testing for Marburg virus. Arrangements can be made through PHEL for appropriate sample types to be sent to the CDC for diagnostic testing. Contact the PHEL at 609.984.2622 for more information.

3) DISEASE REPORTING AND CASE INVESTIGATION

A. Purpose of Surveillance and Reporting

- To identify potential sources of transmission which may exist in the United States (such as non-human primates or laboratory specimens).
- To identify sources of transmission and geographical areas of risk outside of the United States.
- To stop transmission from such sources and geographical areas.
- To identify cases as early as possible to prevent transmission to other persons or animals.
- To identify cases and clusters of human illness that may be associated with a bioterrorist event.

B. Laboratory and Healthcare Provider Reporting Requirements

The New Jersey Department of Health and Senior Services requests that healthcare providers **immediately report** any suspect case of MHF, or any potential exposure to an agent which could cause MHF to the local health officer having jurisdiction over the locality in which the patient lives. If this is not possible, call the NJDHSS Infectious and Zoonotic Diseases Program at 609.588.7500 during business hours, or 609.392.2020 after business hours, on weekends and holidays. Telephone reports shall be followed up by a written or electronic report within the 24 hours of the initial report.

Note: Since the CDC is the principal testing laboratory for viral hemorrhagic fevers including MHF in the United States, any case in New Jersey resident would be reported to NJDHSS by CDC, and the Department would, in turn, notify the local health officer in the community where the patient resides.

C. Local Department of Health Reporting and Follow-Up Responsibilities.

1 Reporting Requirements

The New Jersey Administrative Code (N.J.A.C. 8:57-1.8) stipulates that each local health officers must report the occurrence of any suspect or known case of Marburg hemorrhagic fever, as defined by the reporting criteria in Section 2 A above. Current requirements are that cases be **immediately reported** to the NJDHSS Infectious and Zoonotic Diseases Program.

2. Case Investigation

a. **The most important step a local health officer can take if he/she learns of a suspect case of MHF, or any potential exposure to an agent, which could cause MHF, is to call the NJDHSS Infectious and Zoonotic Diseases Program immediately**, any time of the day or night. The daytime phone number of the Infectious and Zoonotic Program is 609.588.7500 during business hours, and 609.392.2020 after business hours, on weekends and holidays.

b. The NJDHSS Infectious and Zoonotic Diseases Program will direct case investigation of New Jersey residents, in conjunction with the CDC. If a bioterrorist event is suspected, the NJDHSS and other authorities will work closely with local health officer(s) and provide instructions/information on how to proceed.

c. Following immediate notification of the NJDHSS, the local health officer(s) may be asked to assist in investigating any patient living within their communities, including gathering the following:
   1) The patient's name, age, address, phone number, status (hospitalized, at home, deceased), and parent/guardian information, if applicable.
   2) The name and phone number of the hospital where the patient is or was hospitalized.
   3) The name and phone number of the patient's attending physician.
   4) The name and phone number of the infection control official at the hospital.
   5) If the patient was seen by a healthcare provider before hospitalization, or seen at more than one hospital, the names and phone numbers of the providers and hospitals as well.

d. The local health officer(s) may be asked to assist in completing CDS-1 Reporting Form . The report may also be filed electronically over the Internet using the Communicable Disease Reporting System (CDRS). Most of the information required on the form can be obtained from the healthcare provider or the medical record. Use the following guidelines in completing the form:
   1) Record "Marburg hemorrhagic fever" as the disease being reported.
   2) Record the patient's demographic information.
   3) Record the date of symptom onset, symptoms, date of diagnosis, hospitalization information (if applicable), and outcome of disease (*e.g.*, recovered, died).
   4) Exposure history: Use the incubation period range for MHF (3 to 9 days). Specifically, focus on the period beginning a minimum of 2 days prior to the patient's onset date back to no more than 16 days before onset for travel history; determine the date(s) and geographic area(s) traveled to by the case to identify where the patient may have become infected.
   5) Complete the important travel history section to indicate where MHF was acquired. If unsure, check "Unknown."
   6) Include any additional comments regarding the patient.
   7) If there have been several unsuccessful attempts to obtain patient information (*e.g.*, the patient, his relatives or healthcare provider does not return calls or respond to a letter, or the patient refuses to divulge information or is too ill to be interviewed), please fill out the form with as much information as possible. Please note on the form the reason why it could not be filled out completely. **If CDRS is used to report, enter collected information into "Comments" section.**

After completing the form, it should be faxed to the NJDHSS Infectious and Zoonotic Diseases Program (fax number 609.631.4863), or the report can be filed electronically over the Internet using the confidential and secure Communicable Disease Reporting System (CDRS). Call the IZDP at 609.588.7500 to confirm receipt of your fax.

f. Institution of disease control measures is an integral part of case investigation. It is the local health officer's responsibility to understand, and, if necessary, institute the control guidelines listed below in Section 4, "Controlling Further Spread."

4) CONTROLLING FURTHER SPREAD

A. Isolation and Quarantine Requirements (N.J.A.C. 8:57-1.10)

Minimum Period of Isolation of Patient
Patients should be isolated until they are clinically well, and then monitored. Because blood and secretions may contain virus for up to several months, patients and families must be educated and monitored for infectiousness. Male patients should refrain from unprotected sexual activity until the semen has been shown to be free of virus or for 3 months. For more detailed recommendation see "Management of Patients with Suspected Viral Hemorrhagic Fever—United States" MMWR 1995/44(25);475-479 .

Minimum Period of Quarantine of Contacts
See Section 4 B, "Protection of Contacts of a Case," directly below.

B. Protection of Contacts of a Case

There is no immunization or prophylaxis for contacts of cases. Healthcare workers and other contacts of known or suspected cases of MHF should practice standard (including respiratory) precautions together with contact precautions to reduce their chances of acquiring MHF. Their healthcare provider should monitor individuals who have had any contact with infectious patients for the maximum 21 days. The monitoring should include checking body temperature at least 2 times daily for at least 3 weeks after last exposure. If an exposed individual develops a temperature greater than 38.3 C (101 F), the individual should be immediately hospitalized in a strict isolation facility.

C. Managing Special Situations

Reported Incidence Is Higher than Usual/Outbreak Suspected
If an outbreak is suspected, primary investigation will be handled by the NJDHSS in conjunction with the CDC. A source of infection, such as travel to a geographical region where a known outbreak of MHF is occurring, will be sought and applicable preventive or control measures will be instituted. The NJDHSS can determine a course of action to prevent further cases and can perform surveillance for cases that cross several jurisdictions and therefore be difficult to identify at a local level. The local health officer may be asked to assist in the investigation to help determine the source of infection and to implement any necessary control measures.

Note: If a bioterrorist event is suspected, the NJDHSS and other authorities will work closely with local health officers and provide instructions/information on how to proceed.

D. Preventive Measures

Environmental Measures
No environmental measures are necessary; MHF does not occur naturally in United States.

Personal Preventive Measures/Education
To avoid cases of MHF:

- Avoid traveling to areas with known outbreaks of MHF.
- Laboratory workers handling specimens suspected of containing the agents of MHF must take appropriate precautions.
- Persons working with imported non-human primates (NHPs) should know the signs of MHF in NHPs; and **immediately report** any cases of suspect or confirmed MHF in NHPs to the NJDHSS.

For more information regarding international travel and MHF, contact the CDC's Traveler's Health Office at 877.394.8747 or through the Internet at <http://www.cdc.gov/travel>.

ADDITIONAL INFORMATION

There is no formal CDC case definition for MHF. CDC case definitions are used by state health departments and CDC to maintain uniform standards for national reporting. For reporting a case to the NJDHSS, always refer to criteria in Section 2 A of this chapter.

REFERENCES

CDC. Management of Patients with Suspected Viral Hemorrhagic Fever-United States. MMWR 1995/44(25);475-479.

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